

REMARKS

Applicants have considered the outstanding official action. It is respectfully submitted that the claims are directed to patentable subject matter as set forth below.

Applicants have amended the title as suggested by the Examiner.

A replacement set of drawings is attached wherein Figures 2 and 3 have been labeled prior art as requested by the Examiner. Further, the legend of Figure 1 has been changed to read "Prior Art" rather than "State Of The Art" to conform Figures 1, 2 and 3. Additionally, Figure 7 is amended to set forth the reference number "1" on the first cylinder. Acceptance of the replacement drawings is respectfully requested.

The Abstract has been rewritten to remove legal phraseology.

Claim 4 is objected to under 37 CFR 1.75(c) as being in improper multiple dependent form.

Claim 1-3 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite on the basis that

certain phrases (as noted on page 3 of the office action) lack antecedent basis.

Claims 1-10 have been canceled. Elected claims 1-4 have been rewritten respectively as new claims 11-14 to remove drawing references, correct the dependency of claim 4 and provide proper antecedent basis therein. While non-elected claims 5-10 have been canceled, applicants reserve the right to file divisional applications on the non-elected subject matter of claims 5-10.

The outstanding rejections based on art are as follows:

- (1) Claims 1 and 3 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 4,272,473 (Riemersma);
- (2) Claims 1 and 3 under 35 U.S.C. §103(a) over WO 00/73053 (Kotani);
- (3) Claim 1 and 3 under 35 U.S.C. §103(a) over U.S. Patent No. 5,091,032 (Schulz); and
- (4) Claim 2 under 35 U.S.C. §103(a) over any one of Riemersma, Kotani and Schulz, as applied to claims 1 and 3 above, and further in view of U.S. Patent No. 6,475,346 (Lefebvre Du Grozriez).

Claim 11 is the sole pending independent claim.

Claim 11 is directed to a device for joining at least two layers to form a multilayer web product. The device includes a rigid first cylinder and a rigid second cylinder which form a first nip therebetween. The second cylinder contains protuberances thereon and the first cylinder has a smooth surface. The first and second cylinders are constructed and arranged to interact such that the structure and relative relation of the cylinders provide localized mutual adhesion of two layers as they pass through the first nip. The device also includes a pressure roller having a resilient surface that is less rigid than the surfaces of the first and second cylinders. The pressure roller and the second cylinder are constructed and arranged to interact to provide an embossing nip therebetween. The embossing nip is downstream of the first nip and thus is structured to receive the layers with localized mutual adhesion. The pressure roller and the second cylinder are distanced from each other so that the protuberances of the second cylinder penetrate into the resilient surface of the pressure roller. Accordingly, the claimed device includes components structured and arranged with respect to each other to join multiple layers of material, such as paper, by first causing

ply-bonding by fiber intermingling based on a smooth surfaced rigid cylinder and rigid cylinder with protuberances, and then embossing of the bonded layers based on a pressure roller with resilient surface and rigid cylinder with protuberances. Applicants respectfully submit that the applied art does not teach or suggest the claimed device.

More particularly, with respect to Riemersma applied under 35 U.S.C. §102, the apparatus disclosed in Riemersma serves to provide a three-dimensional form to a single plastic film. The film is first heated and then embossed between a first pressure roller 15 and embossing roller 13. The embossing roller 13 has conical protrusions 26 (see Figure 2). The protrusions are then perforated upon passing through a nip formed between rigid embossing roller 13 and perforating roller 17. The film is thereafter passed through a third nip formed by embossing roller 13 and second pressure roller 18 to reacquire the embossing in the film. The plastic film is thus rendered three-dimensional.

The perforating roller 17 is smooth and perforation is achieved by melting the top surface area of the embossed protrusions of the film, while the latter is

still engaged with the conical protrusions of the embossing roller 13.

Applicants claimed device is not structured to perforate plastic, but rather to join two layers to form a multilayer web product. The device of Riemersma is not suitable for joining two layers. The structure of the apparatus of Riemersma cannot join layers of material and, therefore, is not relevant to the claimed device.

Additionally, in the claimed device, the smooth first rigid cylinder is arranged upstream of the resilient surfaced pressure roller with respect to the web feed direction. The opposite arrangement is taught in Riemersma. This difference is significant since it directly affects the capabilities, i.e., purpose and function, of the two different machines. The apparatus of Riemersma is arranged to emboss a film first followed by perforation and a second embossing. Thus the embossing, rubber-covered roller 15 of Riemersma must be arranged before the smooth perforating roller 17. In the applicants' claimed device, the cylinders are arranged to first mechanically join two layers by fiber intermingling, i.e., pressure applied between the first smooth rigid cylinder and the second rigid cylinder with protuberances. Downstream a pressure roller is arranged in

relation to the second cylinder in a manner to serve to emboss the joined layers based on said protuberances of the second cylinder and said resilient surface of the pressure roller. This structural arrangement is different from that taught in Riemersma.

Accordingly, Riemersma does not anticipate that claimed device since Riemersma does not teach each and every element of the claimed device. Withdrawal of the §102 rejection based on Riemersma is, thus, respectfully requested.

As to Kotani and the rejection under 35 U.S.C. §103, claim 11 differs therefrom in several respects. First, the relation between the first rigid cylinder and the second rigid cylinder is defined as providing pressure to cause localized mutual adhesion by fiber intermingling of two layers. This is a limitation defining the structural interrelationship of the two rigid cylinders.

Kotani fails to teach the same structural interrelationship as claimed by applicants. This is particularly evident on the basis that Kotani does not address the problem of joining multiple layers, but rather is directed to embossing a single paper ply. In particular, the claimed device differs from Kotani because the first

rigid cylinder claimed is smooth surfaced while the two rollers 10, 12 of Kotani each have protrusions and cavities. The protrusions and cavities mesh with one another (see Figures 8 and 9) in order to emboss a paper web passed through a nip formed between rollers 10 and 12.

The Examiner asserts that "the use of a rigid embossing cylinder cooperating with a rigid smooth cylinder was well known and conventional in the embossing art" (page 5 of the office action). Applicants respectfully disagree with the Examiner's assertion. Applicants submit that embossing cannot be performed between a rigid embossing roller with protrusions and a rigid smooth roller. A web would not be embossed because the protrusions of the first roller must either penetrate into cavities (which are not provided) of an adjoining roller or deform a soft layer covering an adjoining roller, which is not present in a smooth surfaced rigid cylinder.

Applicants further submit that it would not have been obvious to replace one of the rigid embossing rollers 10, 12 of Kotani with a smooth rigid roller as claimed since the two device structures, i.e., of Kotani and applicants' claim 11, serve different purposes, have different functions and solve different problems.

Kotani discloses a device which has the purpose of embossing a web between two mutually co-acting rigid rollers 10, 12 having embossing protrusions that provide embossments on both surfaces of a web (see Figure 1). These protrusions are obtained by co-action of the two rollers as shown in Figure 8. Roller 10 also has recesses 30, which are phased with higher projections 28 of roller 12. The structural arrangement is such that portions of the web corresponding to recesses 30 are not embossed between the two rigid rollers 10 and 12, but rather between the rigid roller 12 and the rubber roller 14. In order to achieve this result, the rollers 12 and 14 are arranged such that the distance between these two rollers causes only the protrusions 28 to press against the rubber coating of roller 14. Pressure is thus applied only on those areas where no embossing has been performed between rollers 10 and 12.

Thus, even though the use of rigid smooth rollers in combination with rigid rollers having protrusions was known, this does not make the invention obvious since one skilled in the art would not have had any teaching or suggestion to modify the apparatus of Kotani to provide the claimed device. Accordingly, withdrawal of the §103 rejection based on Kotani is respectfully requested.

With regard to the rejection under 35 U.S.C. §103 over Schulz, the two rollers 46, 48 as shown in Figure 3 of Schulz are both provided with protrusions. Conversely, in the claimed device, one of the rigid cylinders is smooth surfaced. There is no suggestion to one skilled in the art to replace one of the rollers having protrusions as described in Schulz with a smooth rigid cylinder as claimed by applicants since the purpose and function of the two cylinders is different. Schulz is directed to embossing a web, which cannot be achieved with a smooth rigid cylinder interacting with a rigid cylinder with protuberances as claimed.

The language defining the pressure and the effect of the pressure between the smooth rigid cylinder and the second rigid cylinder with protrusions in the claimed device defines a structural feature, namely the arrangement of the level of pressure with respect to the effect to be achieved. This further distinguishes the claimed device from that of Schulz. Schulz discloses meshing rollers 46, 48, i.e., rollers wherein the protrusions of one roller mesh between the protrusions of another roller. There is no mutual contact, let alone pressure between the two rollers of Schulz. The claimed device requires an arrangement of

claimed first and second cylinders to provide pressure therebetween sufficient to achieve localized mutual adhesion by fiber mingling as recited in the claim.

The resilient or rubber roller 50 of Schulz has the function of calendering the web, i.e., to smoothen the top surface of the protrusions generated in the first embossing nip 52. See column 2, lines 17-23. The rubber roller calenders the surface of the web to "promote the perception of smoothness". In the claimed device, the structural interrelationship of the cylinders and pressure roller is to first bond layers without embossing and subsequently emboss the adhered layers by pushing the protuberances of the second rigid cylinder into the outer resilient coating of the pressure roller. The claimed device achieves a quite opposite effect from that taught by Schulz, namely that a previously smooth paper, which was calendered by the two rigid cylinders, is three-dimensionally deformed by the resilient cover of a pressure roller co-acting with protrusions on a rigid cylinder.

Accordingly, applicants submit that Schulz does not render the claimed device obvious within the meaning of 35 U.S.C. §103. Withdrawal of the §103 rejection is, thus, respectfully requested.

With respect to the rejection under 35 U.S.C. §103 over any one of Riemersma, Kotani or Schulz as applied to claims 1 and 3 (now claims 11 and 13) and further in view of Lefebvre du Grosriez, Lefebvre de Grosriez is applied with respect to the added limitation of dependent claim 2. Applicants resubmit the basis for distinction as set forth above as to the device of claim 11 and each of Riemersma, Kotani and Schulz and further submits that Lefebvre du Grosriez does not make up for the shortcomings thereof. Lefebvre du Grosriez does not teach or suggest the arrangement of the first smooth surfaced rigid cylinder, second rigid cylinder with protuberances and pressure roller with a resilient surface as claimed by applicants. Accordingly, withdrawal of the §103 rejection as to claim 2 is respectfully requested.

Accordingly, applicants respectfully submit that the applied references do not anticipate or render the claims obvious within the meanings of 35 U.S.C. §102 or §103, respectively. Thus, withdrawal of the rejections under 35 U.S.C. §102 and 103 is respectfully requested.

Reconsideration and allowance of the application are respectfully urged.

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Group Art Unit 1722

Respectfully submitted,

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Attachment - Replacement Drawings (4 Sheets/10 Figures)